



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/651,696	08/30/2000	Peter Ledel Gammel	18-47-1-57	2486
530	7590	11/17/2005	EXAMINER	
LERNER, DAVID, LITTENBERG, KRUMHOLZ & MENTLIK 600 SOUTH AVENUE WEST WESTFIELD, NJ 07090			PATEL, ASHOK	
			ART UNIT	PAPER NUMBER
			2879	

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/651,696

Applicant(s)

GAMMEL ET AL.

Examiner

Ashok Patel

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 8-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>041105</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

Art Unit: 2879

1. The Examiner considers previously non-considered prior art publication "AR", which was inadvertently omitted. Please see the enclosed PTOL-892. Under 37 C.F.R. 1.98, the Examiner considers all prior art references cited on PTOL-1449, filed on 04/11/2005, except very last publication "BA", since it does not include its publication date.

2. Applicant is advised to update all co-pending U.S. Patent Applications cited at several instances in the specification.

3. Applicant's arguments filed 04/11/2005 have been fully considered but they are not persuasive.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 8-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhang et al (USPN 5,536,988, of record).

Zhang et al disclose applicant's claimed device (Figs. 1-2) including a vacuum micro-electromechanical device that includes:

Art Unit: 2879

a device substrate (12), a cathode (22) attached to the substrate having emitters, a cathode emission control grid (282) attached to the device substrate (the grid controls or shapes emission of electrons emitted from the cathode), an output structure with the cathode surface and the grid surface substantially parallel and the cathode or grid attached to the device substrate by one or ore flexural members (col. 5, lines 54-67).

As to claim 9, Zhang et al disclose (col. 5, lines 54-67) one or more flexural members attached to the device substrate y one or more flexural members.

As to claim 10, Zhang et al disclose (Figure 8) the cathode and grid surfaces are substantially perpendicular to the device substrate surface.

As to claim 11, Zhang et al disclose (Figs. 1, 5) the cathode and grid surfaces are substantially perpendicular position by locking mechanisms attached to the device substrate by one or more flexural members.

Consequently, Zhang et al anticipate applicant's claims 8-11.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2879

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 12-14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al in view of Komatsu (USP 5,386,172).

Although, Zhang et al do not disclose the device including anode as claimed by applicant, providing additional electrode, such anode (also known as electron collector electrode) within the vacuum microelectronics device is well known to those skilled in the art for using the device as tetrode. Also modifying the device to include additional electrodes between cathode and anode is also known in the art to use as pentode.

Komatsu, in the same field of endeavor, is cited for showing the vacuum microelectronics device including the additional electrode(s) (Figs. 7, 13, 14, 16, 18, 21 etc.) for the stated purpose.

Art Unit: 2879

Consequently, it would have been obvious to one of ordinary skill in the art to modify Zhang et al's device to use as tetrode, pentode etc.

8. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al in view of Bower et al (USPN 6,630,772).

As to claim 15, although Zhang et al do not disclose the emitter including nanotubes, the use of carbon nanotubes is known in the art for emitting electrons. Bower et al is cited for showing the use of carbon nanotubes as emitter within the vacuum microelectronic device.

Consequently, it would have been obvious to one of ordinary skill in the art to modify Zhang et al's device to include carbon nanotubes as cathode for emitting electrons.

9. Claims 16, 17 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al.

Although Zhang et al do not disclose a specific dimensional limitation as recited in applicant's claims 16 and 17, applicant's such claimed dimensions would have been obvious to one of ordinary skill in the art since it has been held that where general conditions of the claim are discovered in the

Art Unit: 2879

prior art, discovering the optimum or workable range involves only routine skill in the art. In re Aller, 105 USPQ 233.

As to claims 19-20, although Zhang et al do not exemplify a plurality of above-mentioned vacuum micro-electronics devices, it is known in the art to provide such plural vacuum micro-electronics devices by cascading repeating structures.

10. Applicant argues, at page 7, that Zhang et al do not disclose a gridded microwave tube device including control cathode emission. The Examiner disagrees with applicants. Since emission of the electrons (from the cathode) is being controlled by the grid by focusing or accelerating the emitted electrons, the Examiner takes the position that Zhang et al do not disclose the gridded microwave tube device including control cathode emission.

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will


Art Unit: 2879

expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ashok Patel whose telephone number is 571-272-2456. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Ashok Patel  
Primary Examiner  
Art Unit 2879